

3.4 Wetlands and Vegetation

This section presents information related to wetlands and vegetation within the proposed S2GF site; the 230 kV transmission line to Canada; the natural gas pipeline; water/wastewater pipeline corridors; and the two Whatcom County 115 kV transmission lines. Existing conditions, potential impacts of the proposed construction and operation, and mitigation measures for those potential impacts are presented.

A list of common and scientific names of plant species described in this section is provided in Appendix C. Wetland plant community types referred to in this section are based on the U.S. Fish and Wildlife Service wetland classification system (Cowardin et al. 1979) and include palustrine emergent (PEM), palustrine scrub-shrub (PSS), and palustrine forested (PFO). Wetlands are defined as follows:

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (33 CFR 328.3, 40 CFR 230.3)

3.4.1 Sources of Information

Information used in this section is based on Section 3.4 of the ASC (Sumas Energy 2 et al. 2000) and on field surveys conducted by Dames & Moore and Bexar Environmental Consulting Ltd. and includes the following:

- Wetland delineation of the S2GF site and natural gas pipeline conducted by David Evans and Associates, Inc. and Bexar Environmental Consulting Ltd. using the 1987 U.S. Army Corps of Engineers (Corps) Wetland Delineation Manual and the USDA-NRCS National Security Food Act Manual, Part 514. The results of this delineation were subsequently confirmed by the Natural Resource Conservation Service (NRCS) and the Corps. (Barger 1999, Gillies 1996)
- A 1998 wetland field reconnaissance inventory and mapping of the proposed water line, sewer line, and 230 kV electric transmission lines by Bexar Environmental Consulting Ltd.
- Wetland reconnaissance field inventories of the proposed S2GF/Bellingham and S2GF/Custer transmission line corridors conducted by Black & Veatch and Dames & Moore, both in 1999.
- A wetland functions and categorization assessment for all project facilities, except the two Whatcom County transmission lines, conducted by Bexar Environmental Consulting Ltd., using the Washington Department of Ecology Draft Wetland

Characterization Methodology, and the Washington State Wetland Rating System (Ecology 1993).

- Wetland Mitigation Report (Bexar Environmental Consulting, LTD., 1999) describing existing conditions and mitigation for proposed generation plant site, the 230 kV transmission line to Canada, and the natural gas pipeline.
- Aerial photography at the NRCS Whatcom County Office (Lynden, WA) examined for the presence of agricultural wetlands (e.g. farmed wetland or prior converted cropland).
- Information on federal status species and state priority species and habitats requested from the Washington Department of Natural Resources Natural Heritage Program for the project area (see Appendix D). Federal or state listed or special status plant species with the potential to occur in the vicinity of the project area were reported with their listing status.

3.4.2 Existing Conditions

3.4.2.1 S2GF Site

Vegetation

The S2GF site has existed as agricultural cropland for many years. Records indicate corn to be the dominant crop since at least 1974, with infrequent cycles of fallow pasture growth or hay. During 1998 the land was fallow and dominated by barnyard grass, red clover, white clover, broad-leaf plantain, timothy grass, quackgrass, and corn stubble. The land was subsequently tilled in October 1998 to prepare it for the planting of corn the next year. The plant site is flanked by fallow pasture to the east, State Route 9 to the south, and agricultural cropland and wetland to the west.

Wetlands

Although artificial drainages (ditches and drain tile) have been installed as part of the agricultural practices on the S2GF site, two wetland areas are present. One wetland is a farmed wetland pasture (FWP) and the other is a wetland ditch. The FWP was tilled as recently as October 1998 to prepare the field for corn planting the following year. The FWP is located in the northwest portion of the plant site, is 0.9 acre in size, and is contiguous with a 9.4-acre PSS/PFO/PEM wetland located offsite and west of the S2GF site. The FWP is dominated by reed canarygrass, and barnyard grass is also present during the warmer portion of the growing season.

The 9.4-acre wetland consists of 8.8 acres of scrub-shrub and forested wetland, and 0.6 acre of emergent wetland around its perimeter. According to the City of Sumas

Shoreline Master Program (December 28, 1998) regulations, the wetland is rated as a Category III wetland and a 25-foot buffer would be used to maintain this wetland's existing functions. The City of Sumas issued a Certificate of Land Use Consistency on March 2, 1999 confirming the wetland's category, classification, and the associated buffer width.

The other wetland area is associated with a ditch that conveys seasonal runoff across the S2GF site from west to east and eventually discharges into Johnson Creek, offsite of the S2GF site. Plant species in the wetland ditch include reed canarygrass and barnyard grass. The area of the wetland ditch on the S2GF site is 1.0 acre. The referenced wetland areas are shown in Figure 3.4-1.

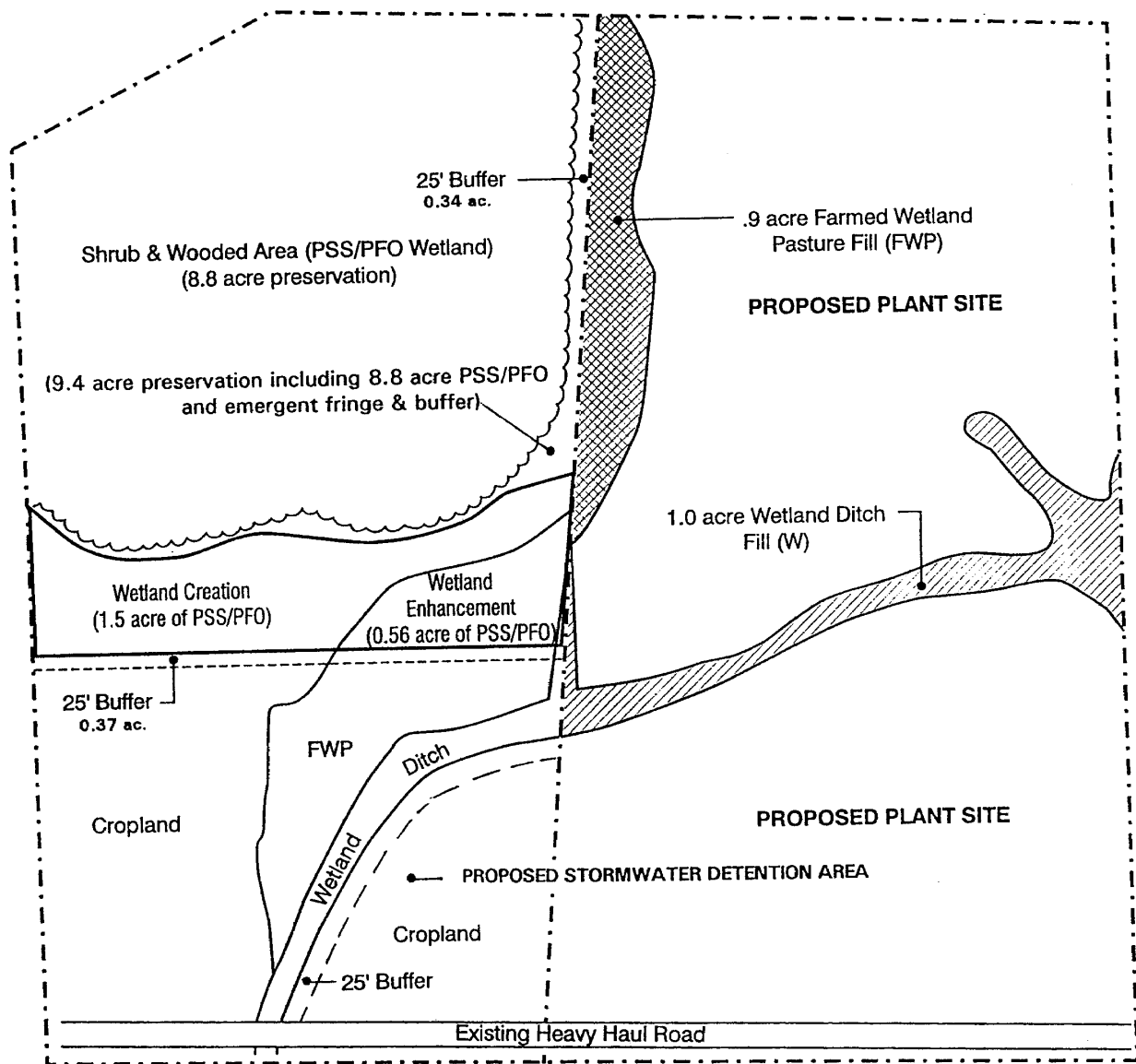
3.4.2.2 Natural Gas Pipeline

Vegetation

The proposed pipeline route passes through agricultural croplands and agricultural grasslands. Corn is the dominant agricultural crop. Kentucky bluegrass, white clover, orchard grass, bentgrass, and chickweed typically dominate the pastures. The pipeline also crosses several roadside ditches and abandoned railroad grades. Shrub and tree growth within the existing pipeline ROW has been kept to a minimum by agricultural use and periodic maintenance.

Wetlands

The natural gas pipeline route crosses ten PEM wetlands, one PSS wetland, and one PFO wetland as shown in Figure 3.4-2 and summarized in Appendix C. The pipeline would cross four higher quality wetlands by drilling under the wetlands. These wetlands are Wetland M at Johnson Creek, Wetland L at Bone Creek, Wetland I at the Sumas River, and Wetland K, an isolated wetland. These four wetlands are rated Category III wetlands according to the Washington Department of Ecology Wetlands Rating System and Category II based on the City of Sumas Wetland Ordinance. The PEM wetlands are typically dominated by creeping bentgrass, false dandelion, and reed canarygrass and are rated as Category III and IV using Ecology's method because of their relatively small size, monotypic grass cover, and minimal wildlife habitat features. Vegetation within the PSS wetland includes red alder, Douglas' spirea, Scouler willow, while Pacific ninebark and black cottonwood dominate the PFO wetland.



WETLAND FILL	1.9 ac. (82,764 sf PEMI)
WETLAND MITIGATION	
Wetland Creation	2.06 ac. (89,600 sf PSS/PFO)
& Enhancement	
South Mitigation Buffer Boundary	0.37
Shrub & Forested Preservation	8.8 ac.
South Emergent Fringe Preservation	0.3 ac.
East Boundary Buffer Preservation	0.34 ac.
Total	11.87 ac.

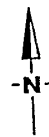


Figure 3.4-1
S2GF Site Wetland Impacts and Mitigation

INSERT FIGURE 3.4-2

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3.4.2.3 Water/Wastewater Pipelines

Vegetation

The proposed water and sewer pipelines would be located along road shoulders adjacent to agricultural grasslands, wetlands, residential lawns, and an industrial storage area that supports little vegetation. Vegetation present in the road shoulders consists of grasses and herbaceous species including bentgrass, perennial ryegrass, quackgrass, white clover, and narrow leaf plantain.

Wetlands

Corridor width is dependent on the final design of the installation and upgrade of the sewer pipeline. The maximum width considered for the construction corridor would include three PSS wetlands located along Bob Mitchell Avenue (see Figure 3.4-3). These wetlands are Category III wetlands according to the assessment using Ecology's Rating System. The vegetation in these wetlands is comprised of willow, immature red alder, red-osier dogwood, black twinberry, and Douglas' spirea interspersed with reed canarygrass and Himalayan blackberry.

3.4.2.4 230 kV Electrical Transmission Line to Canada

Vegetation

The proposed 230 kV transmission line corridor to the Canadian border is 1/2 mile long and primarily follows the Bob Mitchell Avenue shoulder area (see Figure 3.4-3). The shoulder areas are primarily vegetated by grasses and herbaceous plants including bentgrass, reed canarygrass, perennial ryegrass, quackgrass, white clover, narrow leaf plantain, dandelion, thistle, and common tansy. Regular clearing and mowing maintain this vegetation.

A narrow section adjacent to Sumas Creek is dominated by reed canarygrass and Himalayan blackberry, and scattered red alder. Additional shrub species include salmonberry, snowberry, black twinberry, red elderberry, and Douglas' spirea. Other trees that are scattered throughout the alignment in the proposed 50-foot-wide maintenance corridor include black cottonwood, paper birch, Oregon ash, and Pacific willow.

The most northerly 800 linear feet of the proposed corridor is situated within an abandoned railroad grade. Most of this area is dominated by creeping bentgrass, perennial ryegrass, orchard grass, white clover, and timothy grass. Other areas are vegetated by exotic or invasive species common to disturbed areas.

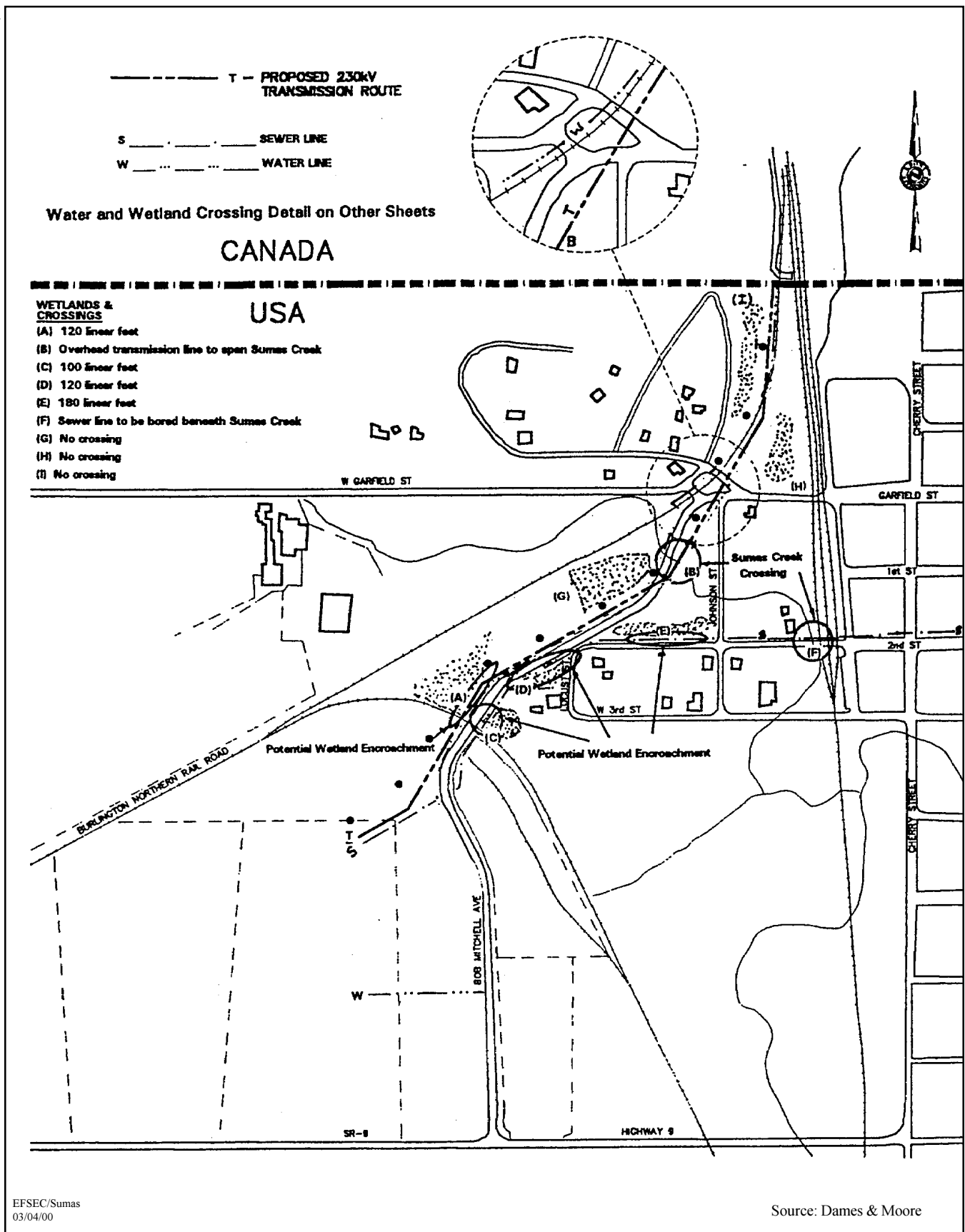


Figure 3.4-3
Utility and Overhead Transmission Line Routes

Wetlands

Most of the vegetation along the existing railroad and road ROW has been cleared or is regularly maintained. PEM wetland areas are typically dominated with dense stands of reed canarygrass interspersed with Himalayan blackberry. Wetland areas immediately outside the cleared ROW are mostly PSS communities comprised of willow, immature red alder, red-osier dogwood, black twinberry and Douglas' spirea interspersed with reed canarygrass and Himalayan blackberry. Where the proposed alignment would cross Sumas Creek, the adjacent riparian plant community consists of red alder, paper birch, salmonberry, black twinberry, Douglas' spirea, red-osier dogwood, Himalayan blackberry and willow.

3.4.2.5 115 kV Transmission Line - S2GF/Bellingham Route

Vegetation

The S2GF/Bellingham route is approximately 24 miles long and is to be placed mostly in or adjacent to existing public road shoulders, except where the line exits the plant site and crosses the Nooksack River. The shoulder areas are primarily vegetated by grasses and herbaceous plants including bentgrass, reed canarygrass, perennial ryegrass, quackgrass, and white clover. Regular clearing and mowing maintains this vegetation.

The northern portion of the corridor is also routed through crop and pastureland. In the southern portion, most forested areas adjacent to the corridor, with only a few exceptions, have been cleared sufficiently to accommodate the transmission line without additional clearing. These forested areas are dominated by black cottonwood.

Wetlands

Fifty wetlands were found to occur within the corridor (see Figures 3.4-4a and 3.4-4b). These wetlands are briefly described, including habitat type and wetland rating, in Appendix C. Reed canarygrass is the dominant plant in most of the 29 PEM wetlands. Vegetation within the 12 PSS wetlands include Douglas' spirea, willow, red alder, and black cottonwood.

Wetlands associated with the Nooksack River are rated as Category I using Ecology's rating system (Ecology 1993). Due to the sensitive nature of some of the wetlands, two alternatives are considered for the Nooksack River crossing (Figure 3.4-4a). One occurs at the end of Noon Road and is approximately 1,247 feet long. The other occurs at the ends of Pollinder and Timon Roads and is approximately 873 feet long. The PSS wetland on the south bank of the Nooksack River crossing at Noon Road is dominated by Sitka and Pacific willows. Black cottonwood and Pacific willow dominate the north bank. A PFO wetland on the east bank of the Nooksack River at Timon Road is dominated by black cottonwood.

The proposed corridor would also cross the wetlands associated with Tenmile Creek. These wetlands are rated as Category II, generally have more than one habitat type, and are dominated by reed canarygrass, Douglas' spirea, and some red-osier dogwood.

3.4.2.6 115 kV Transmission Line - S2GF/Custer Route

Vegetation

The S2GF/Custer route is also approximately 24 miles long and primarily occurs in shoulder areas along public roads, except where the line exits the S2GF site (see Figure 3.4-4b and 3.4-4c). The road shoulder areas are primarily vegetated by grasses and herbaceous plants including bentgrass, reed canarygrass, perennial ryegrass, quackgrass, and white clover. Regular clearing and mowing maintain this vegetation.

This route is located adjacent to agricultural lands with significant cropland areas. Forested areas adjacent to the route are relatively few and most have been cleared sufficiently to accommodate the transmission line without additional clearing. One exception is a parcel of mature forest dominated by Douglas-fir along Zell Road immediately east of Interstate 5 that is owned by Washington Department of Natural Resources (DNR). The forest closely abuts the roadside for approximately 1,000 feet. Berthusen Park, located on the southwest corner of West Badger Road and Berthusen Road intersection, contains a small, isolated stand of mature forest.

Wetlands

Sixteen wetlands were found within the corridor. All wetlands in this corridor are rated Category III. The individual wetlands found in the proposed corridor are briefly described in Appendix C. Reed canarygrass is a common species within the 13 PEM wetlands. Some immature red alder and big-leaf maple are occasionally present. The two PSS wetlands contain Douglas' spirea while black cottonwood and willows are found in the one PFO wetland.

3.4.2.7 Sensitive Plant Species

No federal or state listed or special status plant species were documented within or adjacent to the project area following a search of the DNR Natural Heritage Program database. However, four plant species were reported to occur in the vicinity of the project area (see Appendix D). Western pearlshell, bristly sedge, and bulb-bearing water-hemlock are considered state sensitive species and soft-leaved willow is considered a state threatened species. None of these species were reported to occur within 0.5 mile of the project area.

INSERT FIGURE 3.4-4A

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INSERT FIGURE 3.4-4B

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INSERT FIGURE 3.4-4C

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3.4.3 Environmental Impacts of Proposed Action

This section addresses the likely impacts on vegetation and wetlands that are associated with the construction and operation of the S2GF project facilities. Construction impacts are those associated with the permanent fill or placement of material to construct facilities and the temporary impacts from trenching to install utility lines. Operational impacts are those associated with maintenance of the transmission and utility lines and the operation of the S2GF. Impacts on other functions commonly associated with vegetation and wetlands such as water resources, wildlife use, and aesthetics are addressed in Sections 3.2, 3.5, and 3.6, respectively.

3.4.3.1 Construction

Impacts during construction at any of the proposed facilities and within existing corridors would involve direct disturbance to vegetation through heavy equipment, vehicle, and crew activities. The disturbances would include vegetation clearing, digging, filling, grading, trenching, and compaction of vegetation and soils. Exposure and compaction of soils could encourage colonization of weedy species adapted to disturbed sites if measures are not taken to reduce the establishment of these species.

Total construction impacts on vegetation include the permanent loss of 27.5 acres of agricultural land at the plant site. Approximately 5.0 acres of low quality herbaceous vegetation communities (fallow agricultural fields, road shoulders, existing utility corridors) would be temporarily disturbed to dig trenches for water, wastewater, and natural gas lines or holes for transmission line towers. Wetland impacts would include 1.9 acres of permanent fill on farmed and PEM wetlands to construct the S2GF, 0.6 acres of temporary disturbance to install the gas pipeline, and 0.1 acre associated with installation of the water and wastewater lines. These impacts on vegetation and wetlands are described below.

Currently, the U.S. Army Corps of Engineers has authorized the fill of 1.9 acres of wetlands at the plant site and up to 0.25 acre of impact associated with utility lines under the nationwide permit process (Barger 1999). Authorization of additional wetland impacts associated with utility line construction, under the Nationwide Permit 12, is at the Corps' discretion. The Corps is also reviewing the project under the individual permit process under the applicant's request in case the existing Nationwide Permit 26 expires before project construction begins.

S2GF Site

Vegetation

Construction of the S2GF would result in the permanent loss of 27.5 acres of agricultural land, mostly planted with corn, the dominant crop since 1974. The impacts on vegetation include direct clearing and filling that would be required to construct the generation plant.

Wetlands

Construction of the S2GF would result in the filling of 1.9 acres of PEM wetlands. Of these, 0.9 acre is farmed wetland pasture (FWP) and 1.0 acre is a wetland ditch (W). The 0.9 acre of FWP is located near the east edge of the offsite PSS/PFO/PEM wetland. This activity would result in the loss of wetlands dominated by reed canarygrass and barnyard grass. A portion of the farmed wetland's buffer consisting of an agricultural grassland area (east of the FWP) dominated by reed canarygrass would also be filled. Wetland impacts for the S2GF site are shown in Figure 3.4-1.

Impaired hydrologic functions on the wetlands from constructing the S2GF include the reduced capacity to retain stormwater, floodwater, sediments, and nutrients. However, converting the existing agricultural land use to the S2GF also reduces sources of sediments, nutrients (fertilizers), and possibly herbicides. Site development would reduce agricultural runoff and the S2GF site runoff would be retained and treated as discussed in Section 3.2. Hydrologic functions of the ditch would be maintained by routing the flow through the project site in a constructed swale and associated culverts.

Filling of the plant site is not expected to decrease surface hydrology for the adjacent PSS/PFO wetland. Surface runoff from the S2GF site does not drain into the PSS/PFO wetland because of a north-south ditch that carries runoff south to the east-west wetland ditch. Therefore, placement of the S2GF facility would not substantially reduce the site's contributing watershed to the PSS/PFO wetland. In addition, the PSS/PFO wetland receives surface water primarily from the farmland to the west, an area that would not be affected by the proposed action. Wetland hydrology is also supported by a high seasonal winter water table which would not be disrupted by the plant site. Any existing drain tiles located south of the PSS/PFO wetland would be removed as the site is developed for mitigation to increase the potential for groundwater to continue to influence the site's wetland hydrology.

Natural Gas Pipeline

Vegetation

Installation of the gas pipeline would result in the temporary disturbance of agricultural croplands and agricultural grasslands located within the existing pipeline ROW. The pipeline is to be laid parallel to the existing 8-inch pipeline within the ROW. Ten feet of the ROW has been dedicated to activities associated with trenching and temporary soil stockpiling. However, an 80-foot-wide area of disturbance is associated with general

equipment transport and other crew activities. No trees would be removed for the proposed pipeline installation and approximately 0.3 acre of agricultural and pasturelands would temporarily be disturbed from trenching.

Wetlands

An estimated 24,880 square feet (0.6 acre) of PEM wetlands and one small PSS wetland (1,280 square feet) would be temporarily impacted due to the installation of the pipeline. Impact acreage is based on a 10-foot-wide corridor crossing through the individual wetlands. The primary disturbance within the 80-foot corridor is associated with the removal of vegetation and trenching of wetland soils to install the natural gas pipeline that would occur in the 10-foot-wide corridor. Most of the disturbance would be in agricultural areas maintained as hayed pasture or as corn cropland during the 1999 growing season. One small PSS wetland dominated by willow, and associated with a ditch along a railroad, would also be affected. All wetlands disturbed by project activity would be graded to pre-project contours that would allow existing wetland conditions and agricultural activities to re-establish. Appendix C summarizes the anticipated impacts.

Wetland buffers would be encroached upon at wetlands G and H, which are associated with the Sumas Road ditch near the Sumas River and have a Whatcom County default buffer of 100 feet. Construction is proposed within this buffer, however no staging of equipment or stockpiled soils are proposed within 50 feet of the wetland except for temporarily sidecast trench material. These wetland buffers were cropland (corn) in 1998. Buffers and wetlands associated with the Sumas River, Johnson Creek, and Jones Creek would not be encroached upon by the drilling operations, which would maintain twice the setback distance required. All areas would be restored to pre-project contours.

Water/Wastewater Lines

Vegetation

Vegetation impacts are considered minimal because water/wastewater lines would be placed mostly within existing, disturbed areas of road shoulders. Impacts attributed to the water and sewer lines would be temporary, involving the removal of weedy vegetation along roads or on agricultural fields where line installation would occur.

Wetlands

Wetland and wetland buffer impacts associated with the proposed waterline would be avoided where an existing waterline would be used for most of the required length. The new 300-foot segment from Front Street to Bob Mitchell Avenue would be placed in the road shoulder.

Although most of the sewer line installation and force main upgrade would be placed within existing road shoulder areas free of wetlands, there may be slight encroachment into the edges of three PSS wetlands adjacent to Bob Mitchell Avenue (see Figure 3.4-3). The maximum wetland impact would be the temporary disturbance of approximately

4,000 square feet of wetlands. The disturbance would occur at a 10-foot width in three separate wetlands. Potential wetland impacts include the disturbance to wetland vegetation by field crews and equipment. No impact to the wetlands along the other portions of the water and sewer line corridor is anticipated as work can typically be accomplished within 10 feet of the road edge. Wetlands would be avoided to the extent possible. However, if during the final design stage potential wetland impacts would occur from trenching or soil displacement, City and County permitting procedures, including full wetland delineation and mitigation, would be implemented.

Potential impact to wetland buffers associated with the three PSS wetlands, assuming a 50-foot buffer width, is estimated at 3,000 square feet. All of these buffer areas are in a disturbed condition and encompass the City road shoulder or ditch.

No impacts to Sumas Creek are anticipated, as the proposed line would be drilled at the location of a 60-inch culvert beneath Second Street.

230 kV Electric Transmission Line to Canada

Vegetation

The proposed 230 kV line would be placed within the existing road and railroad ROW; therefore impacts are expected to be minimal. Construction of the transmission line would result in the removal of the nonnative, weedy vegetation along the road shoulders where poles would be installed. The poles for this line would typically be 100 feet tall. Depending on tree location relative to transmission lines, trees that require trimming would be trimmed to a height of 25 feet to a maximum of 100 feet.

Within the alignment there may be vegetation impacts associated with establishing the 50-foot maintenance zone. Some immature red alder trees and up to five mature black cottonwoods and mature red alders scattered throughout the alignment may require removal along Bob Mitchell Avenue and the Sumas Creek area. This loss of tree canopy could result in a more developed shrub layer with potential intrusion by Himalayan blackberry.

Wetlands

Typically, transmission line poles would be placed on road shoulders to facilitate their maintenance and avoid direct impacts on wetlands and along Sumas Creek. However, one pole would be located at the northeast edge of an existing Category III, PSS wetland dominated by red-osier dogwood, Douglas' spirea, and salmonberry. This potential impact would be less than 0.1 acre due to the minimal area needed to reach the site and dig a footing for the pole. Buffer conditions that surround the wetland which could be disturbed include industrial storage area to the south and pastureland north of the wetland. No vegetation impacts would occur in the industrial area as this site is barren ground; pasture grasses would be trampled by construction crews and equipment.

This wetland area is referred to as Wetland A in the wetland mitigation report prepared for the S2GF (Bexar Environmental Consulting Ltd., 1999). It is uncertain whether the pole installation would actually impact this wetland because another unrelated project may impact the wetland before the transmission line is constructed. The unrelated project is in the final stages of being authorized for filling through the Corps permit process. If the Corps permit process is completed and the unrelated project construction fills the wetland, no impacts on wetlands from installation of the transmission pole would occur.

Another pole is shown to be located in the south buffer of a PEM wetland (Wetland G) and would impact less than 0.1 acre. This wetland and its buffer are both dominated by reed canarygrass. The wetland is a Category III wetland according to the City of Sumas rating system and the State wetland rating system. The part of the wetland and buffer where the footing would be placed is also in the process of being permitted for filling.

115 kV Electric Transmission Line – S2GF/Bellingham Route

Vegetation

Construction of this transmission line would result in the removal of the nonnative, weedy vegetation along the road shoulders where poles would be installed. Vegetation impacts associated with crossing the Nooksack River at Noon Road or at the Pollinder and Timon Roads site would include topping or permanently trimming trees to a height of 25 to 100 feet and would require the removal of several large cottonwoods as discussed below under Wetlands.

Wetlands

Based on the distribution and size of wetlands along the proposed corridor, construction of the transmission line is not expected to require fill of wetlands or their buffers. Poles are expected to be placed outside of wetlands. However, pole placement is subject to change during the final design phase. Should potential impacts on wetlands due to construction of the transmission lines be identified, City and County permitting procedures, including full delineation of wetlands, would be followed.

Indirect impacts on wetlands would occur for maintenance of the corridor. Clearing and trimming of trees taller than 25 feet would occur in a maximum of nine wetland buffers and five wetlands. Trimming or clearing would occur only on the wetland edge for three of the wetlands. The gaps created by this activity would be maintained for the duration of the transmission lines.

Two alternatives exist for the Nooksack River crossing. Despite the greater total span length and greater wetland span length, the Noon Road alternative appears preferable since no mature black cottonwood trees would be cleared and only a few mature black cottonwood trees would be trimmed for this crossing. In contrast, the crossing at the Pollinder and Timon Roads would require clearing of at least 10 mature black cottonwoods on the west bank and trimming of 5 to 10 black cottonwoods and Pacific

willow trees on the east bank. Wetland impacts are summarized for this proposed route in Appendix C.

115 kV Electric Transmission Line – S2GF/Custer Substation Route

Vegetation

This alignment contains a few areas of forest and isolated mature trees within a 50-foot-wide maintenance corridor that would require limited clearing or trimming to construct the transmission line. Most of these areas occur within the corridor for less than 500 linear feet along agricultural and residential areas. Transmission line installation would also require that the DNR owned forest on Zell Road be cleared an additional 20 feet for a distance of approximately 1,000 feet. Approximately 12 mature and immature Douglas-fir trees would be selectively removed. Many of the trees in this section would be trimmed. No other impacts to upland vegetation are anticipated other than the disturbance to weedy herbaceous vegetation as poles are placed in the ground.

An isolated mature forest stand at Berthusen Park is located south of W. Badger Road. In this vicinity the transmission corridor is located along the north side of the road. The north side of the road is a mixture of agricultural land and disturbed forest that would require little or no trimming.

Wetlands

Determination of impacts to wetlands assumes wetlands and their buffers would be avoided. However, pole placement is subject to change during field design. Should wetlands be impacted by construction of transmission lines, City and County permitting procedures, including full delineation of wetlands, would be followed.

Clearing and trimming of trees taller than 25 feet would occur in a maximum of two wetland buffers and no wetlands. The gaps created by this activity would be maintained for the duration of the transmission line. Wetland impacts for this route are summarized in Appendix C.

3.4.3.2 Operational Impacts

Operational impacts are those impacts that would occur after the S2GF and utilities are constructed. Such impacts would be associated with the maintenance of the S2GF site and vegetation trimming or removal to avoid interference with operation of the pipelines or the overhead transmission lines.

S2GF Site

Vegetation

The S2GF site would be landscaped around the perimeter and around proposed permanent parking areas. This converted landscaping will receive regular maintenance. Areas of natural vegetation would receive trimming as needed to avoid interference with the operation of the proposed facility.

Wetlands

Adjacent wetland plant communities to be created and enhanced as mitigation are described in the wetland mitigation report developed for the plant site, the 230 kV transmission line, and the natural gas pipeline (Bexar Environmental Consulting, Ltd., 1999). Impacts to this wetland mitigation area would be avoided as plant site runoff would be detained and treated outside of the mitigation area.

Use of the well to supply water to the S2GF is not expected to affect wetlands in the area. Wetland hydrology in the wetlands observed at the S2GF site and along utility corridors is maintained primarily by the winter season rainfalls, which saturate the soil, and the seasonally high groundwater levels. Wetland soils become saturated as the amount of precipitation entering the soil exceeds its storage capability. The storage capability is minimized as groundwater levels rise near the surface in the winter. Well use is not expected to significantly affect wetland hydrology since groundwater levels during the winter would not be significantly affected by well use. Lower groundwater levels that would occur in the summer from well use would not likely affect the wetlands since groundwater levels are naturally lower in summer when the wetlands are drier. See Section 3.2, Water Resources, for a discussion of the effects of well use on groundwater levels.

Transmission Line ROW Maintenance

Trees would be maintained within transmission line ROW to prevent interference with the electrical transmission lines. Management of tall, dead, and dying trees is required to prevent damage to transmission lines from windthrow (Figures 3.4-5a and b). Within 25 feet of the transmission lines, all trees of a mature height of 25 feet or greater would be removed. Trees less than 25 feet may remain, and tree trimming is permitted in the wire and clearing zone if tree removal is not desired due to ownership, environmental, or cost considerations. Between 25 and 30 feet out from the transmission lines, maintenance includes trimming structurally sound conifers that are 20 inches diameter at breast height (dbh) or greater, and deciduous trees that are 25 inches dbh or greater. Trees less than the specified diameter would be removed. Outside of 30 feet, maintenance includes the removal of dead, dying, and unstable trees. Trimmed material and tree trunks are typically left on the ground in naturally vegetated areas as habitat features. Maintaining open areas along the edge of forested areas would allow some additional sunlight penetration which could increase shrub or herbaceous growth along the alignment or in adjacent areas.

NOTES:

1. Engineer shall designate all danger trees which are to be removed or topped. The unit for clearing danger trees is "TM-13."
2. The unit for clearing right-of-way of specified width is "TM-14" or "TM-14(1)."

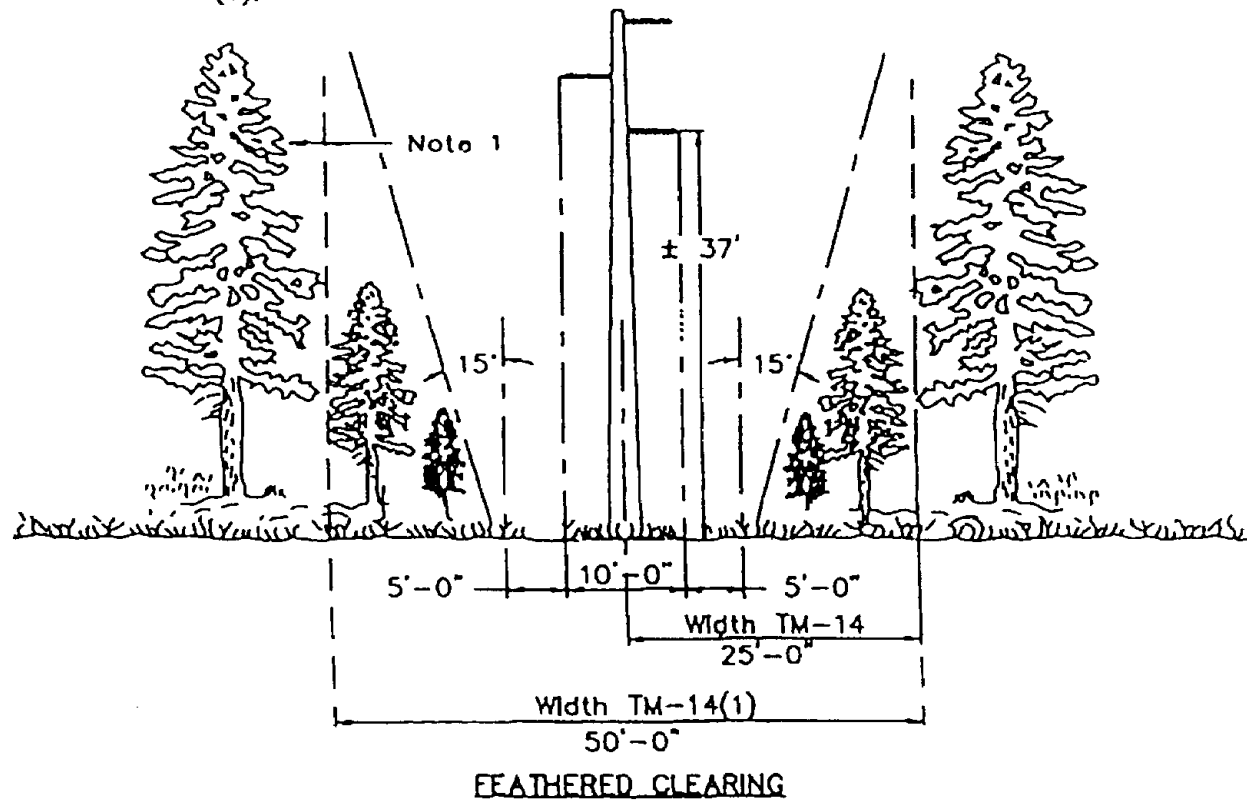
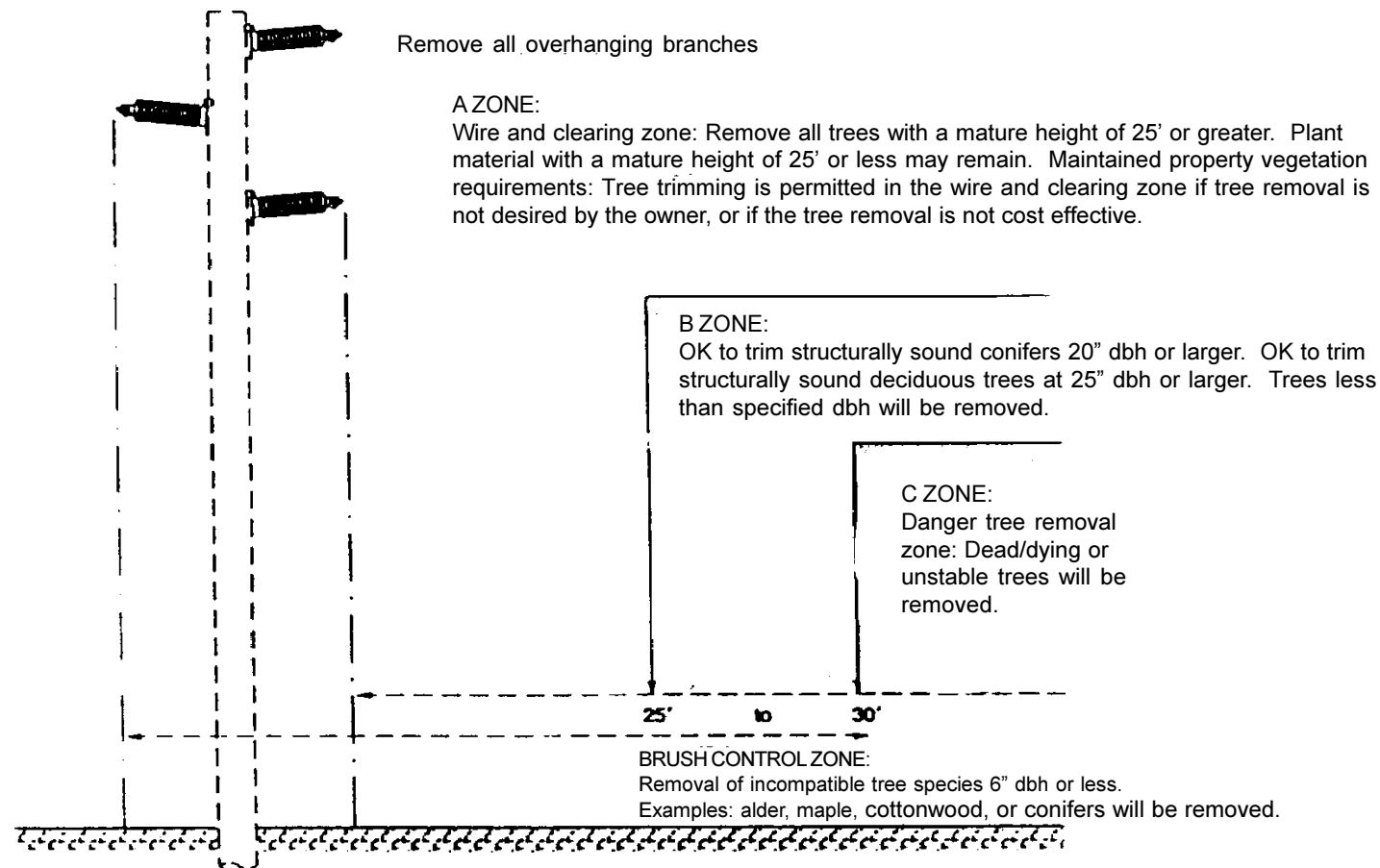


Figure 3.4-5a
Vegetation Management Requirements For Overhead Transmission Lines, Part 1



CONSTRUCTION NOTES:

- > All zoned distances are measured from the wire regardless of construction type to minimize tree-conductor interference under adverse weather conditions and a 5-year maintenance cycle.
- > Diameter at breast height (dbh) measured 4-1/2' above ground.
- > Previously topped trees within the clearing zones are not considered structurally sound.

EFSEC/Sumas
03/04/00

Source: Dames & Moore

Figure 3.4-5b
Vegetation Management Requirements For Overhead Transmission Lines, Part 2

Natural Gas Pipeline / Water/Wastewater Pipelines

To allow for visual inspection, pipeline corridors would be maintained in their existing grassland or agricultural setting with mechanical methods used to remove woody vegetation.

3.4.4 Environmental Impacts of No Action

Under the No Action Alternative, the proposed S2GF, natural gas supply pipeline, water supply pipeline, wastewater collection pipeline, and transmission lines would not be built. The No Action Alternative would result in existing vegetation and wetlands remaining intact. Agricultural activities would continue with crop growing alternating with fallow years and pastures likely to remain grazed. Existing utility line corridors would continue to be maintained, keeping vegetation growth suppressed where it could interfere with overhead transmission lines or pipeline integrity or safety.

Wetland and vegetation impacts could occur on the project site if other industrial facilities were constructed. Potential effects of other projects would be analyzed under separate SEPA review.

3.4.5 Mitigation Measures

Impacts associated with the proposed project activity have been and would continue to be mitigated by applying the following mitigation sequence:

- *Avoiding* impacts. Impacts on higher quality wetlands and native vegetation would be avoided by situating the plant in an area previously cleared for crops. The wetlands within this site are low quality emergent wetlands dominated by non-native, invasive plant species. Impacts to streams from gas pipeline installation would be avoided by drilling underneath stream crossings. Most of the electric transmission line corridor is through an existing ROW that is regularly maintained to avoid disturbing natural areas such as wetlands. Numerous alternative routings were considered during the study in order to avoid or minimize environmental impacts. The use of existing easements along roadways and utility corridors where lines could be overbuilt was maximized.
- *Minimizing* impacts. Unavoidable impacts would be minimized by placing poles outside of wetlands and their buffers and other natural areas as much as is practicable. Wetland impacts are determined based on the avoidance of wetlands and their buffers. However, pole placement is subject to change during field design. Should wetlands be impacted by construction of the transmission lines, City and County permitting procedures, including full delineation of wetlands, would be followed. In addition, the use of Best Management Practices (BMPs), described below, during construction would prevent the discharge of fill material in wetlands and streams. To

minimize the establishment of noxious weeds, construction crews would limit transport of seeds to agricultural or pasturelands from roadside areas by cleaning equipment and vehicles before entering these areas. In addition, weed-free straw bales will be used where appropriate for erosion control.

- *Rectifying* impacts. Unavoidable impacts to upland and wetland areas would be rehabilitated as necessary. Temporary impact sites would be returned to original contours. The top 12 inches of topsoil removed for utility and gas pipeline construction would be salvaged and then replaced after construction is complete. Hydro-seeding of disturbed ground will ensure vegetation cover is re-established. These measures and other measures described in this section would allow the temporarily disturbed areas to revert to pre-construction conditions.
- *Compensating* impacts. Unavoidable impacts to wetlands would be compensated by creating and enhancing other wetlands. The degree of wetland creation and enhancement would follow Ecology (1993) guidelines regarding compensation for the loss of impacted wetlands.

A detailed description of mitigation for impacts to the plant site, the water/wastewater lines, the natural gas pipeline, and the transmission line that follows the water and sewer lines is found in the Wetland Mitigation Report for the Sumas Energy 2, Inc. Electric Generating Plant Facility (Bexar Environmental Consulting Ltd., 1999).

3.4.5.1 Construction

S2GF Site

Vegetation

Mitigation measures to minimize construction impacts are included as part of the design of the S2GF, as presented in Chapter 2. Areas not targeted for fill and grade are to be seeded for control of sediment runoff and wind erosion. Hydro-seeding of the plant site after construction would prevent erosion runoff into the Johnson Creek drainage. Areas within the immediate area of the facility will be landscaped. No other mitigation measures are considered necessary for the S2GF site.

Wetlands

An 11.87-acre mitigation area is proposed to compensate for two low quality emergent wetlands to be lost upon site construction. Compensatory mitigation would consist of preserving an 8.8-acre PFO/PSS wetland area, preserving an approximately 0.64-acre buffer fringe dominated by herbaceous plants, and creating and enhancing 2.06 acres of wetlands and 0.37 acre of wetland buffer (see Figure 3.4-1).

The proposed wetland enhancement area (0.56 acre) and creation area (1.5 acres) is located along the south edge of the 8.8-acre palustrine shrub/forested (PSS/PFO) wetland

located immediately west of the plant site. The combined mitigation ratio (creation/enhancement area to impact area) is 1.08:1. This ratio is considered appropriate due to the disturbed nature of the wetland to be affected and the large (8.8-acre), PSS/PFO wetland area to be preserved.

Although the Corps has authorized up to 1.9 acres of wetland impact at the proposed plant site, and up to 0.25 acre of impact along utility lines under the nationwide permit program, construction of the project cannot occur until the Corps has approved the proposed mitigation plan (Barger 1999). The Corps is currently reviewing the mitigation plan as part of the permit review process. Ecology typically reviews mitigation plans as part of the state's approval of projects requiring water quality certification under Section 401 of the Clean Water Act. The project proponent has met with Ecology and requested Ecology's review of the application, including the mitigation plan. Ecology has not commented on the mitigation plan to date.

All proposed species for planting are native and compatible or similar to naturally occurring species in adjacent wetland areas. The targeted long-term plant community consists of emergent, shrub, and forested areas. Forested areas are proposed along slightly elevated margins to the south, and also on several proposed interior hummocks. Habitat features such as downed logs and stumps would be placed throughout the compensatory mitigation wetland. Emergent species are proposed for the lower areas. Higher margins are to be seeded with a grass mix. Areas where reed canarygrass is to be removed from the wetland enhancement area would be re-seeded with native herbs and grasses.

Proposed plant site mitigation plantings are as follows:

- *Created wetland*; black cottonwood, red alder, paper birch, vine maple, salmonberry, Douglas' spirea, Scouler willow, Pacific willow, red-osier dogwood, slough sedge, and tall mannagrass,
- *Enhanced wetland*; black cottonwood, red alder, paper birch, vine maple, salmonberry, Douglas' spirea, Scouler willow, Pacific willow, and red-osier dogwood, and
- *Wetland buffer*; black cottonwood, red alder, paper birch, vine maple, Nootka rose, salmonberry, Douglas' spirea, Scouler willow, tall fescue, redtop, and alsike clover.

The proposed mitigation area would offset lost or impaired hydrologic and wildlife functions due to site construction. The created wetland would provide additional stormwater storage capacity and sediment trapping, although the mitigation area is not intended for use as a stormwater facility. Construction of seasonally ponded areas in the created wetland is intended to produce suitable amphibian habitat and enhance overall biological diversity.

A proposed stormwater retention pond would treat stormwater runoff. The retention pond would flow into a proposed 880-linear-foot water quality and drainage channel, which would also receive runoff from the south. Runoff from the water quality and

drainage channel would flow into the existing drainage channel along the eastern border of the plant site. This drainage channel is the continuance of the wetland ditch.

The entire 11.87-acre mitigation area of preserved, new, or enhanced wetlands and buffer will be dedicated to the City of Sumas as permanent open space or placed in a conservation easement.

A ten-year monitoring period would be implemented to ensure plant establishment and that wetland hydrology is functioning appropriately.

Natural Gas Pipeline / Water/Wastewater Pipelines

Vegetation

Impacts associated with construction of the natural gas pipeline would be avoided and minimized as previously described. In areas where the gas pipeline traverses agricultural areas, or areas occupied with grasses, the top 12 inches of topsoil would be removed separately from the subsoil and reserved for replacement. Grass areas would be re-seeded, while areas planted in corn may be left as is. In all cases the land would be graded to pre-installation contours. These measures would allow the temporarily disturbed areas to revert to pre-construction conditions.

Wetlands

The natural gas pipeline construction would avoid impacts on Johnson Creek (Wetland M), Bone Creek (Wetland L), Sumas River (Wetland I), and an isolated wetland (Wetland K) by drilling under these resources. If wetlands are encroached upon by sewer line installation, the City of Sumas would apply to the Corps for coverage under Nationwide Permit 12 and would comply with applicable provisions of the permit.

Mitigation for the 24,880 square feet (0.6 acre) of temporary wetland impacts associated with the natural gas pipeline construction and the 4,000 square feet (0.09 acre) of potential wetland impacts associated with water and sewer line installation include implementation of BMPs during and immediately after construction. BMPs would be implemented to control and minimize erosion and sedimentation. These BMPs would include:

- Use of silt fencing around wetlands and buffers in the construction corridor to prevent sedimentation to the resources.
- Final grading of the affected wetland area to pre-project contours.
- Removal, salvage, and replacement of the upper 12 inches of topsoil.
- Installation of impermeable material at the edge of the wetland where appropriate, and in the pipeline trench, preventing wetland drainage.

- Maintaining the flow of existing ditches.
- Reseeding, or hydro-seeding disturbed emergent wetland areas with a native grass mix.
- Stockpiling excavated material in upland areas.
- Proposed mitigation plantings within restored emergent wetlands to include tall fescue, creeping foxtail, bentgrass, redtop, and alsike clover.
- Proposed mitigation plantings within restored shrub wetlands to include vine maple, salmonberry, Douglas' spirea, Scouler willow, Pacific willow, red-osier dogwood, sough sedge, and tall mannagrass.
- Use of construction mats in saturated wetland areas to minimize soil rutting and plant disturbance.

Electric Transmission Lines

Vegetation

To avoid impacts to vegetation, most of the three proposed transmission line corridors would be situated in road shoulder areas where transmission lines currently exist and vegetation is already regularly maintained. Where necessary, trees would be trimmed or topped to prevent interference with overhead transmission lines. Trimmed material and tree trunks would be left on the ground in naturally vegetated areas for habitat features. However, cut debris would be removed from any stream areas to prevent the obstruction of flow through culverts. Footing construction areas would be reseeded as necessary.

Wetlands

Impacts on wetlands are avoided along the 230 kV transmission line by placing poles outside of wetland areas. However, as discussed in Section 3.4.3.1, an unrelated project may provide fill within one wetland which would occur in the same place as the proposed action for a pole footing. In the event the one pole is placed prior to the first project's completion, mitigation for encroachment into the wetland would be provided for through the first unrelated project. According to Dames & Moore biologists, an offsite compensatory mitigation would occur offsite as part of the other unrelated project.

Wetland buffer impacts associated with the PEM wetland that would be affected would be compensated for by hydro-seeding any disturbed area in the pastureland with similar grass species common to the area.

To minimize impacts on wetlands for the two Whatcom County 115 kV transmission lines, the pole footings would be placed in upland areas only. Wetlands within the transmission corridors would not be filled or excavated as part of construction. Pole placement would be adjacent to but not within wetlands. Some wetlands would be

spanned. BMPs as previously discussed for the natural gas pipeline would be used during construction to prevent discharge of fill material into nearby wetlands. Footing construction areas would be re-seeded as necessary.

A large portion of the S2GF/Bellingham route is placed on the Everson Goshen Road to avoid sensitive areas along Noon Road. Compensation for the clearing and trimming that occur in wetlands and wetland buffers would be in the form of wetland and riparian forest enhancement. Enhancement would be located in the riparian area of the Nooksack River in the vicinity of the two locations being considered for the transmission line crossing. Non-native vegetation such as Japanese knotweed and Himalayan blackberry would be removed from these areas by hand pulling and shoveling. Native vegetation such as Sitka willow, Scouler's willow, Pacific willow, and black cottonwood would be planted in these areas as appropriate.

Should field design require that pole placement be changed and impacts on wetlands and their buffers occur, City and County permitting procedures, including full wetland delineations, would be followed.

3.4.5.2 Operation

BMPs previously mentioned will be applied during operation and maintenance relative to wetlands and vegetation within the S2GF site; the transmission lines; the natural gas pipeline; and the water/wastewater pipeline corridors.

3.4.6 Cumulative Impacts

Cumulative effects on wetlands would result from the filling of wetlands on the site, representing an incremental increase to the general loss of wetland in the area. The wetland enhancement and replacement proposed for the site is intended to make up for the loss of onsite cropped wetlands and the wetland ditch. The cumulative effects to the vicinity wetlands would be minor, and may be improved over time due to the replacement of existing wetlands with wetlands of a higher value.

3.4.7 Significant Unavoidable Adverse Impacts

Impacts on wetlands and forest vegetation resulting from the proposed project would occur if the proposed action is taken. These impacts are not considered significant if mitigation measures as discussed are implemented with the proposed action. Construction activity would be mostly located within previously farmed or grazed areas and cleared easements that follow roads and other utility corridors. The vegetation in most of these areas is and has been impacted by agricultural practices, mowing, and grazing pressure. As a result, the areas proposed for disturbance are highly modified plant communities with limited habitat diversity and structure.

Additional vegetation maintenance associated with this project is minimal. Clearing and trimming in areas that are not currently maintained would be minimized by strategic placement of utility and transmission lines (and poles).

In sensitive areas like the Nooksack River riparian area, vegetation will be maintained by trimming for as long as possible to avoid or postpone maintaining vegetation by clearing. This strategy will permit vegetation to develop with the least degree of interference from necessary maintenance practices. In addition, the clearing that may occur to protect transmission lines may benefit the residual stand of timber (the trees that are left to grow) by increasing its available space for growing and thereby facilitating an increase in the stand's growth rate.

Wetland impacts are mitigated by creation, enhancement, and preservation to improve existing wildlife and vegetation conditions. The wetlands associated with the proposed project are generally of low quality. Their vegetation structure and hydrological regimes have previously been degraded through ongoing agricultural activities and activities associated with the construction and maintenance of already existing road, railroad, and utility ROW. Maintenance clearing and trimming have kept plant community structure and diversity suppressed and allowed exotic and invasive species to dominate these wetlands. Therefore, impacts to wetlands associated with the project would be mitigated through proposed creation, enhancement, and preservation measures. Loss of 1.9 acres of wetland functions at the plant site would be replaced by 2.06 acres of created and enhanced wetland areas and would result in greater plant species diversity and structure and wildlife habitat features than the existing farmed wetland. The temporary impacts to small, individual, low quality wetlands along the utility alignments would also be mitigated by restoring contours, reestablishing surface and subsurface soil layers, and enhancing the riparian area along the Nooksack River with native shrub and tree plantings.

Including preservation of 9.4 acres of contiguous higher quality wetland, proposed mitigation measures would result in a total of 11.87 acres of created, enhanced, and preserved wetland and buffer area.